UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

	Application No.	Applicant(s)
Office Action Summary	10/502,282	GIGI, ERCAN FERIT
	Examiner	Art Unit	
	Leon Flores	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>02 November 2007</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-10</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-3, 9 and 10</u> is/are rejected.

7) ☒ Claim(s) <u>4-8</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>25 June 2007</u> is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some *   c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed 11/2/2007 have been fully considered but they are not persuasive.

Response to Remarks

On 11/30/2006, the office mailed out a non-final rejection in which the examiner rejected claims 1-10 under 35 USC 101 because the claimed invention was drawn to non-statutory subject matter. On 2/28/2007, the applicant responded to this rejection by stating that *"the present invention is directed toward "signal conditioning," in particular subtracting quantization noise from a PCM (Pulse Code Modulation) signal. Such signal conditioning inventions were recognized as presenting patentable subject matter in, for example, Arrythmia Research Technology Inc. v. Carazonix, 22 U.S.P.Q.2d 1033 (CAFC 1992). Withdrawal of the rejection is respectfully requested."* Based on this response, and the ruling stating that the utility doesn't have to be stated in the claims but within the disclosure, the examiner withdrew the 101 rejection.

However, upon further reconsideration, the examiner has reissued the same 101 rejection previously made. This is due to the fact that the examiner believes that applicant is simply just claiming a formula, which is an abstract idea.

Applicant asserts that, *"there would be no motivation for one of skill in the art to combine Kim's windowing with the Nishio reference because the asserted combination would be indiscernible and/or inoperable. Accordingly, the Section 103(a) rejection of claims 1 and 9 is improper and Applicant requests that it be withdrawn".*

The examiner respectfully agrees. This rejection has been withdrawn.

Applicant further asserts that, *"that the Office Action appears to be improperly resorting to hindsight reconstruction based upon Applicant's disclosure in an attempt to arrive at a combination that corresponds to the claimed invention"*.

The examiner respectfully disagrees. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant further asserts that, *"the Office Action simply concludes that one would combine the cited equations of the Yutaka Goto reference without providing any reason as to why one of skill in the art would combine these equations. It appears that the Office Action is combining these equations in an attempt to show correspondence to Applicant's equation. Thus, Applicant submits that the Office Action appears to be improperly relying upon Applicant's disclosure as the basis to combine these equations in an attempt to arrive at Applicant's equation"*.

The examiner respectfully disagrees. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the

prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the examiner does not comprehend why the applicant states that there is no reason to combine these equations, when both the Nishio and the Yutaka references deal with a method for calculating quantization noise/error.

Applicant further asserts that, *"it would be illogical and impractical to incorporate this equation into the subtractor 12. For example, subtractor 12 of the Nishio reference determines the quantization error by a simple comparison of two inputs, one without errors and one with errors, whereas Yutaka Goto's equations do not have any corresponding inputs. Thus, inserting the cited equation into Nishio's application would be illogical and would render the Nishio reference unfit for its intended operation of removing the quantization error"*.

The examiner respectfully disagrees. As stated in the last office action, and in this office action below, the reference of Nishio discloses all of the limitations as claimed except that particular equation. However, the Yutaka reference, as stated in the last office action, does disclose the equation as claimed. Having said this, the examiner does not comprehend what the applicant is trying to contemplate by saying that "it would be illogical and impractical to incorporate this equation into the subtractor 12" when one skilled in the art would know that calculation of quantization error is based on the difference between the original and the quantized signal voltages. (This statement

can be found in Herbert Taub, "Principles of communication systems" 2nd edition,

pages 207-209) Therefore, the equation disclosed in the Yutaka reference is based on

the difference between two signals, and it can be incorporated into the subtractor of

Nishio.

Claim Rejections - 35 USC § 101

2.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3.   Claims (1-10) are rejected under 35 U.S.C. 101 because the claimed invention is

drawn to non-statutory subject matter. The examiner submits that Applicant's have not

recited any limitations relating to a practical application in the technological arts and

have merely claimed a manipulation of abstract ideas. (mathematical constructs)

Section 2106 [R-2] (Patentable Subject Matter – Computer-Related Inventions)

MPEP states the following:

"In practical terms, claims define nonstatutory processes if they:
– consist solely of mathematical operations without some claimed practical application
(i.e., executing a "mathematical algorithm"); or
– simply manipulate abstract ideas, e.g., a bid (Schrader, 22 F.3d at 293-94, 30
USPQ2d at 1458-59) or a bubble hierarchy (Warmerdam, 33 F.3d at 1360, 31
USPQ2d at 1759), without some claimed practical application."

In this case, claims 1-10 are simply drawn to the manipulation of abstract ideas

(mathematical constructs – formulation of a quantization error) as follows:

Claims 1-8: method for calculating a quantization error.

Claims 9-10: apparatus for calculating a quantization error.

An invention which is eligible for patenting under 35 USC § 101 is in the "useful

arts" when is a machine, manufacture, process or composition of matter, which

produces a concrete, tangible, and useful result. The fundamental test for patent

eligibility is thus determine whether the claimed invention produces a "useful, concrete

and tangible result."

(See Interim Guidelines, Annex 5)

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

6.   **Claims (1-3 & 9-10) are rejected under 35 U.S.C. 103(a) as being**

unpatentable over Nishio et al. (hereinafter Nishio)(US Patent 5,774,842) in view of

Yutaka Goto (hereinafter Yutaka), "Effects of Noise on the Interpolation Accuracy

for Apodized FFT Spectra of Time-Domain Damped signals", Department of

Information Science and Electronics, Tsukuba College of Technology, Tsukaba-

shi, Ibaraki, 305 Japan, Volume 49, Number 12, 1995.

Re Claim 1, Nishio discloses a method for subtracting quantization noise from a

pulse code modulated PCM signal being segmented into frames (See Fig. 8 & 14 &

Abstract), comprising the steps of: calculating for each frame of said PCM signal a

constant quantization noise level Bq (See Fig. 8: the input of unit 13) subtracting the

quantization noise as represented by said quantization noise level Bq from said PCM ·

signal. (See Fig. 8 & col. 4, lines 66-67).

Nishio fails to disclose the following equation: $8 B q = n = 0 W - 1 \{ (s \min * [n] -$

$s \max * [n]) w [n] \} 2\ 12$ wherein n: indicates a specific sample of the PCM signal;

$S*.sub.\min[n]$: represents the minimum quantization noise level for a specific sample

value $s*[n]$ of said PCM signal; $S*.sub.\max[n]$: presents the maximum quantization

noise level for the specific sample value $s*[n]$ of the PCM signal; $w[n]$: represents a

window-function; and W: represents the number of samples per window.

However, Yutaka does. (See whole document, and specially section "Theory"

equations 8-11) Yutaka discloses several equations describing Frequency-Domain S/N

ratio due to quantization and windowing. Equation 9 describes the power spectrum of

noise, which is comprised of the standard deviation and some windowing function. On

the other hand, equation 11 describes the quantization error, in which Yutaka further

recites that "In digital processing of sampled analog signals, the quantization error is

commonly viewed as an additive noise signal. With the use of the relation the squared

root of the quantization error is equal to the standard deviation. If we substitute this relationship into equation 9 we yield that the power spectrum of noise is equal to the quantization error times some windowing function. And this is exactly the formula the applicant is claiming in both claims 1 and 9.

Therefore, taking the combined teachings of Nishio and Yutaka as a whole. It would have been obvious to one of ordinary skill in the art to have incorporated this feature into the system of Nishio, in the manner as claimed, and as taught by Yutaka, for the benefit of determining the power spectrum of noise as a function of the quantization noise and some windowing function.

Re claim 2, the combination of Nishio and Yutaka further discloses that characterized in that the minimum quantization level $S^*.sub.min$ as well as the maximum quantization level $S^*.sub.max$ are known. (In Yutaka, see equation 11.)

Re claim 3, the combination of Nishio and Yutaka further discloses that characterized in that the minimum quantization level $S^*.sub.min$ and the maximum quantization level $S^*.sub.max$ are predicted according to the following equations: $S^*.sub.min=i[n]-(i[n]-i.sub.min[n])/2$ $S^*.sub.max=i[n]+(i.sub.max[n]-i[n])-/2$ wherein i: represents one out of a plurality of possible representation levels predefined due to the specific PCM quantization method applied to an original signal; i[n]: represents that predefined representation level which corresponds to the sample value $s^*[n]$ for a specific n; i.sub.min[n]: represents that representation level which is--startet from i[n]--

the next smaller non-zero representation level for which u[n]=1; i.sub.max[n]: represents

that representation level which is--startet from i[n]--the next bigger non-zero

representation level for which u[n]=1; with the usage array u[i] being defined to: $9\,u\,(\,i\,)$

$= \min(\,1\,,\,n = 0\,L - 1\,\{\,0\,,\,s*[\,n\,]\,i\,1\,,\,\text{otherwise}\,)\,,\,-2\,N - 1\,i < 2\,N - 1$ wherein L:

represents the number samples of the whole PCM-signal; and N: represents the

number of bits used for quantizing an original sample value by using PCM to generate

the PCM sample values s*[n]. (In Yutaka, see section "Theory". Furthermore, one

skilled in the art would know how to make and use of these equation in order to come

up with the quantization levels.)

Re claim 9, this claim is a system claim comprising elements that would have

necessitated the corresponding method steps of claim 1. Therefore, this claim has

been analyzed and rejected in view of claim 1.

Re claim 10, the combination of Nishio and Yutaka further disclose that

characterized in that it is located at a decoder's side. (In Nishio, see fig. 16: element 53

& col. 12, lines 24-30)

Allowable Subject Matter

1.   Claims (4-8) are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Re claim 4, the further limitation of, *"the method according to claim 1, characterized in that the substracting of the quantization noise represented by said quantization noise level Bq from the PCM-signal is carried out in the frequency domain according to the following steps: computing the spectrum S*[k] of the PCM signal s*[n] and forming the magnitude .vertline.S*[k].vertline. thereof; computing a signal-to-noise ratio SNR[k] of said spectrum S*[k] according to: SNR[k]=.vertline.S*[k].vertline./Bq; calculating from said signal-to-noise ratio SNR[k] a filter magnitude F[k] according to a predefined filter algorithm based on at least one filter update parameter; calculating an output spectrum S.sup.b[k] at least substantially free of said quantization noise by multiplying both the real part R{S*[k]} and the imaginary part I{S*[k]} of the spectrum S*[k] with said filter magnitude F{k}; and transforming the output spectrum S.sup.b[k] back into a signal s.sup.b[n] in the time domain"*. Claims 5-8 depend on claim 4 above.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
November 28, 2007

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER